has a smooth density; when the subordinator is a gamma process, the weight distribution of samples is purely singular if the "sampling fraction" (by volume) is sufficiently close to zero or one, contrary to the usual assertion that weight distributions are normal.

On a Class of Cumulative Processes in Warranty Analysis and Pension Accumulation

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Consider a point process with time-varying interoccurrence intervals. For $i = 1, 2, \ldots$, let the ith interval start at t_{i-1} and terminate at t_i where $0 \equiv t_0 < t_1 < \cdots$. Write $X(t_{i-1}) = t_i - t_{i-1}$. Assume that the distribution of $X(\tau)$ depends continuously on τ but, given t_i, $X(t_i)$ does not depend on $X(t_j)$, $j < i$. Let $N(t)$ be the number of occurrences during $(0, t]$, and, for $x \geqslant 0$ arbitrary but fixed, let $U(s, \tau, X(\tau))$ represent a function of the interval $X(\tau)$, its starting epoch τ, and the constant s. Define

$$W(s, t) = \sum_{i=0}^{N(t)-1} U(s, t_i, X(t_i)), \quad N(t) > 0 \qquad (W(s, t) = 0 \text{ if } N(t) = 0)$$

as the cumulative "reward" during $(0, t]$.

Time-dependent behavior of processes of the type $\{W(s, t), t \geqslant 0\}$ and related questions are investigated. Some special cases of interest are: (1) $U = 1$ if $X \geqslant s$, $U = 0$, otherwise; in this case, $W(s, t)$ is the number of occurrences during $(0, t]$ that are preceded by intervals of length $\geqslant s$; (2) $U = X$ if $X \geqslant s$, $U = 0$, otherwise; in this case, $W(s, t)$ is the total time spent during $(0, t]$ in sojourns of length $\geqslant s$; (3) $U = \min(s, X)$, when $W(s, t)$ represents the total time measured during $(0, t]$, if the clock is stopped whenever $X > s$. These processes have applications in warranty analysis and pension accumulation.

Equilibrium in a Multi-Agent Consumption/Investment Problem

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Each of finitely many agents is endowed with a commodity stream, and the agents must collectively, dynamically determine the price of this commodity for purposes of trading. The agents invest their income from trading in a market whose stock prices are continuous semimartingales. The agents may also consume the commodity, and do so in order to maximize the expected utility of consumption, subject to the condition of almost sure nonnegative wealth at the final-time. Equilibrium obtains when a commodity price process can be found so that each agent solving his own stochastic control problem results in aggregate consumption exactly equal to aggregate endowment, for all times, almost surely. Such an equilibrium will be exhibited.